



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,898	04/09/2007	Chang-Jun Ahn	215384-106380	4048

44200 7590 07/06/2009
HONIGMAN MILLER SCHWARTZ & COHN LLP
38500 WOODWARD AVENUE
SUITE 100
BLOOMFIELD HILLS, MI 48304-5048

EXAMINER

NGUYEN, LEON VIET Q

ART UNIT	PAPER NUMBER
----------	--------------

2611

MAIL DATE	DELIVERY MODE
-----------	---------------

07/06/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,898	Applicant(s) AHN, CHANG-JUN	
	Examiner LEON-VIET Q. NGUYEN	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/13/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 7/13/06 was filed after the mailing date of 7/13/06. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 3-5, and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kambayashi et al (OFDM/SDM System Using Adaptive Transmit Phase Control to Mitigate Co-Channel Interference, 2002 IEEE 56th Vehicular Technology Conference Proceedings, Vol. 4 of 4, Vancouver, Canada September 24-28, 2002) in view of Sibecas et al (US20040264592) and further in view of Hottinen et al (US20020009156).**

Re claim 1, Kambayashi teaches a communication system comprising a transmitter (transmitters 1-M in fig. 4) and a receiver (receiver in fig. 4),

(a) the transmitter comprising:

Art Unit: 2611

a serial-parallel converting unit which performs serial-parallel conversion of the coded signal to two signal groups (S/P converters in fig. 4);

a first transmission unit which receives one of the serial-parallel converted signal groups (transmitter 1 in fig. 4); and

a second transmission unit which receives an other one of the serial-parallel converted signal groups (transmitter M in fig. 4);

each of the first transmission unit and the second transmission unit including:

a prephasing unit which performs a prephasing process on each of signals included in the input signal group received (phase control circuits in fig. 4);

an inverse Fourier transform unit which performs inverse Fourier transform on signals originating from the prephasing process (IFFT in fig. 4); and

a transmitting unit which transmits the inverse Fourier transformed signal with a predetermined polarization (the transmission antennas in fig. 4, having a predetermined polarization is well known in the art),

(b) the receiver including:

a receiving unit which receives a signal transmitted from the transmitter with a predetermined polarization (the receiving antenna in fig. 4);

a Fourier transform unit which performs Fourier transform on the received signal (FFT in fig. 4);

a detection unit which performs MLD detection of signals originating from the Fourier transform (ML estimator in fig. 4);

a parallel-serial converting unit which performs parallel-serial conversion on the MLD detected signals (P/S converter in fig. 4); and

a decoding unit which decodes a signal originating from the parallel-serial conversion to output the transferred signal (decoding circuit in fig. 4),

(c) the transmitter performing the prephasing process on each of the signals in such a way that a probability that a same phase is generated becomes lower (page 2093 left side last paragraph and page 2094 right side first paragraph, extending the Euclidean distance to reduce the probability of detection error).

Kambayashi a transmitter with a coding unit which codes data to be transferred and wherein a polarity of the predetermined polarization of the first transmission being orthogonal to a polarity of the predetermined polarization of the second transmission unit.

However Sibecas teaches a transmitter (fig. 7) with a coding unit which codes data to be transferred (coding and interleaving unit 70 in fig. 7) and wherein a polarity of the predetermined polarization of a first transmission being orthogonal to a polarity of the predetermined polarization of a second transmission unit (§0077).

Therefore taking the combined teachings of Kambayashi and Sibecas as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of Sibecas into the system of Kambayashi. The motivation to combine Sibecas and Kambayashi would be to increase the data rate of the transmitter (§0073 and §0083 of Sibecas).

Kambayashi also fails to teach wherein the receiver generates feedback information for the prephasing process in the transmitter, and sending the feedback information to the transmitter to perform the prephasing process based on the feedback information sent from the receiver.

However Hottinen teaches the receiver which generates feedback information for the prephasing process in the transmitter (MS 20 in fig. 5), and sending the feedback information to the transmitter (fig. 1) to perform the prephasing process based on the feedback information sent from the receiver (§0009, §0011, §0014).

Therefore taking the combined teachings of Kambayashi and Hottinen as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of Hottinen into the system of Kambayashi. The motivation to combine Hottinen and Kambayashi would be to obtain optimum coherence (§0016 of Hottinen).

Re claim 3, the modified invention of Kambayashi teaches a transmitter in the communication system as set forth in claim 1 or 2 (transmitters 1-M in fig. 4 of Kambayashi).

Art Unit: 2611

Re claim 4, the modified invention of Kambayashi teaches a receiver in the communication system as set forth in claim 1 or 2 (receiver in fig. 4 of Kambayashi).

Re claim 5, the claimed limitations recited have been analyzed and rejected with respect to claim 1. It would be necessary to have a method of using the transmitter as claimed in claim 1.

Re claim 7, the claimed limitations recited have been analyzed and rejected with respect to claim 1. It would be necessary to have a method of using the receiver as claimed in claim 1.

Re claim 8, the claimed limitations recited have been analyzed and rejected with respect to claim 1. It would be necessary to have a program to use the transmitter as claimed in claim 1.

Re claim 9, the claimed limitations recited have been analyzed and rejected with respect to claim 1. It would be necessary to have a program to use the receiver as claimed in claim 1.

3. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kambayashi et al (OFDM/SDM System Using Adaptive Transmit Phase Control to Mitigate Co-Channel Interference, 2002 IEEE 56th Vehicular Technology Conference Proceedings, Vol. 4 of 4, Vancouver, Canada September 24-28, 2002), Sibecas et al (US20040264592) and Hottinen et al (US20020009156) in view of Hanada et al (US20060239233).

Re claim 2, the modified invention of Kambayashi teaches a communication system which performs a prephasing process on signals originating from the serial-parallel conversion (fig. 4 of Kambayashi), instead of performing a prephasing process on the input signals received (fig. 4 of Kambayashi).

The modified invention of Kambayashi fails to teach a communication system wherein each of the first transmission unit and the second transmission unit of the transmitter multiplexes the input signals received and a pilot signal and performs serial-parallel conversion on a signal originating from the multiplexing. However Hanada teaches a communication system wherein each of the first transmission unit (circuit 100.1 in fig. 3) and the second transmission unit (circuit 100.x in fig. 3) of the transmitter (fig. 3) multiplexes the input signals received and a pilot signal (multiplexer 104 in fig. 3) and performs serial-parallel conversion on a signal originating from the multiplexing (serial/parallel converter 105 in fig. 3).

Art Unit: 2611

Therefore taking the modified teachings of Kambayashi, Sibecas and Hottinen with Hanada as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of Hanada into the system of Kambayashi, Sibecas, and Hottinen. The motivation to combine Hanada, Sibecas, Hottinen and Kambayashi would be to have multiple subscribers carry out simultaneous communication on the same frequency band (¶0011) and thus saving bandwidth.

Re claim 6, the claimed limitations recited have been analyzed and rejected with respect to claim 1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON-VIET Q. NGUYEN whose telephone number is (571)270-1185. The examiner can normally be reached on Monday-Friday, alternate Friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Q Nguyen/
Examiner, Art Unit 2611

/Mohammad H Ghayour/
Supervisory Patent Examiner, Art Unit 2611